

PROJECT NUMBER: 2500  
PROJECT TITLE: Fundamental Chemistry  
PROJECT LEADER: J. I. Seeman  
PERIOD COVERED: April 1989

I. REMOVAL OF NICOTINE FROM AQUEOUS TOBACCO PROCESSING FLUIDS (Howe, Secor, Seeman)

- A. Objective: To develop techniques to remove nicotine and other tobacco alkaloids from aqueous tobacco processing fluids to the exclusion of all other components.
- B. Results and Plans: We have confirmed that BIS is transferred from the organic solvent phase to the feed stock, thereby essentially ruling out its use in any membrane process. Exceptional results have been obtained using our latest synthetic LIX (8764-42B) in the membrane process. High nicotine extraction efficiencies have been noted along with excellent reproducibilities and no phase transfer/breakdown. A UV monitor for the on-line quantification of nicotine has been developed by K. Koller and D. Leyden and installed in our system; it is now being used to excellent advantage. An additional batch (80 g) of LIX(8764-42B) has been prepared and 35 g transferred to Sepracor.

II. INORGANICS AS NOVEL TOBACCO MATERIALS ADDITIVES (Fournier, Paine, Seeman)

- A. Objective: To develop inorganic materials for novel applications for reduced sidestream and enhanced subjectives in cigarettes and for required properties in novel smoking materials.
- B. Results and Plans: We have reproduced Don Schleich's procedure for making a magnesium hydroxide "suspension": a 'slurry' of a white precipitate has been obtained; this material will be submitted for x-ray analysis to confirm the presence of the hydroxide and the absence of oxide. A possible hydrotalcite:vanillin complex has been obtained which incorporates up to 42% of the organic material. This may serve as a novel sidestream reductant and flavor release agent. Preliminary studies have been completed on the solubility of "magnesium carbonate" in carbonated water. Only about 1 g of solid residue was found per 100 g of solution, less than the reported literature values.

III. FLAVOR/ODOR CHEMISTRY (Houminer)

- A. Objective: To develop new technologies for smoke deliveries of desired flavorants, especially menthol.
- B. Results and Plans: The commercial scale manufacturing process for glucose menthol carbonate (GMC) has been reviewed. The key step, the reaction of glucose with menthyl chloroformate was carefully

examined by NMR to determine parameters for the industrial scale-up of GMC. Several potential sidestream release agents have been outlined.

IV. CHEMICAL PHYSICS STUDIES OF TOBACCO CONSTITUENTS (Secor, Seeman)

- A. Objective: To obtain structural information about important tobacco constituents/flavorants; to develop information on cluster formation and chemical reactions in clusters.
- B. Results and Plans: 2-(2-Hydroxyethyl)pyrazine was prepared for examination on its unimolecular decomposition in the gas phase and sent to E. R. Bernstein. This is the parent pyrazine-aldehyde release agent. Current studies at CSU are focusing on the addition of organic acids to allylbenzene and related tobacco flavorants.

V. MISCELLANEOUS (Secor)

- A. Results and Plans: A CR-sheet has been completed for the O-succinylated 4'-hydroxyethylnicotine, prepared for B. Davies. Stock solutions of 10 different nicotinoids were prepared also.